UNITED STATES SPECIAL OPERATIONS COMMAND
SIBR FY05.1 Proposal Submission

The United States Operations Command's (USSOCOM) mission includes developing and acquiring unique special operations forces (SOF) equipment, material, supplies and services. USSOCOM is seeking small businesses with a strong research and development capability and an understanding of the SOF operational characteristics. The topics represent a portion of the problems encountered by SOF in fulfilling its mission.

Inquiries of a general nature or questions concerning the administration of the SBIR program should be addressed to:

United States Special Operations Command
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USSOCOM will only accept proposals for those topics stated in this solicitation. The USSOCOM Program Executive Officers (PEOs) responsible for the research and development in these specific areas initiated the topics and are responsible for the technical evaluation of the proposals. The Phase I and Phase II proposal evaluation factors are listed below. Each proposal must address each factor in order to be considered for an award.

Selection of proposals for funding is based upon technical merit and the evaluation criteria included below. Phase I and Phase II funding is limited, therefore USSOCOM will select and fund only those Phase I and Phase II proposals considered to be superior in overall technical quality and most critical to the mission. USSOCOM may fund more than one proposal in a specific topic area if the technical quality of the proposal is deemed superior, or it may fund no proposals in a topic area.

Evaluation Criteria – Phase I & II

1) The soundness, technical merit, and innovation of the proposed approach and its incremental progress toward topic or subtopic solution.

2) The qualifications of the proposed principal/key investigators supporting staff, and consultants. Qualifications include not only the ability to perform the research and development but also the ability to commercialize the results.

3) The potential for commercial (Government or private sector) application and the benefits expected to accrue from this commercialization.

Potential offerors must submit proposals in accordance with the DoD Program Solicitation at www.dodsbir.net/solicitation. The maximum amount of SBIR funding for a USSOCOM Phase I award is $100,000 and the maximum time frame for a Phase I proposal is 6 months. A Phase I proposal for less than 6 months and/or less than $100,000 is encouraged where low risk technologies are being proposed.

USSOCOM, may request a Phase II proposal from any Phase I contractor, based on the results of the Phase I effort using the evaluation criteria above. A Phase II proposal for less than 24 months and/or less than $750,000 is encouraged. The maximum amount of **SBIR funding** allocated for a USSOCOM Phase II award is $750,000 and the maximum time frame for a Phase II award is 24 months. Proposals should be based on realistic cost and time estimates, not on the maximum time (months) and dollars. The cost of the project is based on the overall amount of hours spent to accomplish the work required and the overall term of the project should also be based on the same effort. In preparing the proposal, (including the statement of objectives and milestones), firms should consider that workload and operational tempo will preclude extensive access to government and military personnel beyond established periodic reviews.

Electronic Submission Instructions

All proposal information must be received electronically via the DOD SBIR/STTR Submission site. To submit, proceed to http://www.dodsbir.net/submission. Once registered, a firm must prepare (and update) Company Commercialization Report Data, prepare (and edit) Proposal Cover Sheets, complete the Cost Proposal form, and upload corresponding Technical Proposal(s). The proposal submission, exclusive of the Company Commercialization Report, must not exceed 25 pages.

Paper copies will not be considered. A complete electronic submission is required for proposal evaluation. An electronic signature is not required on the proposal. Please note that there have been problems reported in the past when using AOL for large file uploads; therefore, we suggest using an alternate internet service provider for files larger than 5MB. It is strongly suggested that all firms **submit final, completed proposals 5-7 days prior to the solicitation closing date to ensure complete submission**. *Firms are entirely responsible for complete and timely submission of the proposal.*

Firms are encouraged, but not required, to embed graphics within the technical proposal file. When including images, care should be taken to ensure images are not of excessive size. A resolution of 200 dpi or below is requested for all embedded images. Please use standard fonts in order to prevent conversion difficulties.

Performing a virus check on each proposal to be uploaded electronically is the responsibility of the firm. The detection of a virus on a submitted electronic technical proposal may be cause for proposal rejection. *E-mail submissions will not be accepted.*

The DoD SBIR/STTR Submission site will present a confirmation page when a technical proposal file upload has been received. The upload will be available for viewing on the site within an hour. It is in your best interest to review the upload to ensure the server received the complete, readable file.

For additional information about electronic proposal submission, including uploading your technical proposal, refer to the instructions on the solicitation and the on-line help area of the DoD SBIR/STTR Submission site, or call the DoD SBIR/STTR Help Desk at 866-SBIRHLP (866-724-7457).

Please note that e-mail is the only method of communication that will be used by the contracting office to notify the submitter/proposer if they have or have not been selected for an award, therefore please include the e-mail address of the person authorized to negotiate contracts for your firm.

SOCOM 05.1 Topic Index

SOCOM 05.1 Topic Descriptions

SOCOM05-001 TITLE: Renewable Electric Energy Source for Special Operations Force (SOF) Maritime Combatant Craft

TECHNOLOGY AREAS: Ground/Sea Vehicles, Electronics

OBJECTIVE: Develop a quiet, reusable high-energy source which is able to power auxiliary electrical equipment on Special Operations Forces (SOF) maritime Combatant Craft (CC). In the riverine environment, the CC normally is the Special Operations Craft - Riverine (SOC-R). In that setting, if your presence or position becomes known mission failure is likely and results in an extreme hazard to life of SOC-R personnel. Therefore, when SOC-R is not underway, craft engines are not a viable power source due to the noise associated with operating the engines. The energy source must be capable of being integrated with the craft and supporting hide operations for up to 72 hours. If the energy source needs to be recharged during that period, the recharging method must be quiet. After that hide period and once underway again, the solution must be rechargeable. While underway, the combatant craft's alternators are available as a recharging power source. The energy source solution cannot adversely affect the operation of the craft for follow-on missions. Also, it must be able to withstand a harsh maritime environment and be environmentally friendly.

DESCRIPTION: SOF maritime forces are tasked with conducting waterborne, static hide and surveillance operations. For the purpose of this renewable electric energy source, typical mission characteristics include: SOF CC is stationary; must maintain visual and sound discipline; use of electronic equipment (radios, radar, FLIR, other sensors, etc.) is essential; and lasts up to 72 hours duration in a single hide location. Presently, the user carries an additional eight marine battery sets onboard the CC to meet mission requirements. The craft currently has two twelve-volt deep cycle marine batteries in series with a capacity of 55-amp-hours that is utilized as the service circuit. Starting batteries with the same capacity that are used to start the engines are used as a backup to the deep cycle batteries.

PERFORMANCE REQUIREMENTS: SOF has a need for an electric energy source (long life, quiet, environmentally friendly, light weight, and rechargeable) for SOC-R lay-up mission. A single hide operation may last up to 72 consecutive hours to run electronic and communications equipment. The energy source must be capable of supplying 720 amp-hours on a 24 volt system to the craft so the user can satisfy all mission needs. Steady state current draw is 8-12 amps with a need for a peak current draw of 90 amps for a one minute burst. The power supplied must be steady and non-fluctuating in order to not damage sensitive communications and other electronics equipment. The power supply should be able to survive in a tropical riverine environment in which heavy humidity is constant and intense rainfall frequently occurs. The system should be expected to operate in cold weather as well. Temperature Requirement for the system to operate is -40 to 140 degrees F. With regard to the size and weight of the system, it must be two-man portable with a goal of being one man portable.

PHASE I: The objective of Phase I will be to develop a design that meets the performance specification as stated above. The Government will provide the contractor with the CC's physical dimensions along with space availability and the electronic systems that have to be powered. At the end of Phase I, the contractor shall deliver to the Government a preliminary design package which details the system's performance and form factor.

PHASE II: The contractor will develop a detailed design based on the Phase I preliminary design. After approval from the Government the contractor will build a prototype, and validate performance and form factor. The prototype will be installed on a CC and evaluated in an on operational environment. A detailed design package and the prototype hardware will be deliverables to the Government.

PHASE III DUAL USE APPLICATIONS: All military and commercial boats needing to power electrical equipment for long durations when main engines are not operating and/or not available.

KEYWORDS: Electrical power sources, energy sources, power generation

SOCOM05-002 TITLE: Door Breaching Ammunition

TECHNOLOGY AREAS: Materials/Processes, Weapons

OBJECTIVE: Develop ammunition, fired from a shotgun or the M203 40mm Grenade Launcher, to breach various types of doors that may exist in any country.

DESCRIPTION: USSOCOM has a need to develop better door breaching capabilities. Doors in the current Area Of Responsibility (AOR) may be constructed from, but not limited to, solid wood of varying thicknesses, metal over wood, metal, wooden frame, metal frame, various door handle and lock combinations. Current procedures include use of various shotgun munitions fired from different 12 gauge magnum shotguns. A 40mm round would give shooters the capability to breaching a door from a distance. If a 40mm round can meet this requirement a shotgun would only be required when near the target door, such as may occur when breaching a door in an inner hallway or room. Both the 12 gauge and 40mm rounds must be safe to the shooter employing it in the normal shooting mode, and safe for anyone that is at least 3 feet from the enemy side of the door. The recoil cannot exceed current system recoil. The Computed Recoil Energy must not exceed 60 ft-lbs. Reference US Army Combat Systems Test activity, Aberdeen Proving Ground "Safety Evaluation of Hand and Shoulder Weapons" dated 1 March 1977, TOP 3-2-504.

Ammunition would be fired from various 12-gauge shotguns or the M203 Grenade Launcher and shall be able to breach various door types. The target door should be wooden and at least 2.5 inches thick or thicker, with heavy-duty hinges and deadbolt. A shotgun-breaching round must completely remove one hinge with one shot. When used against the deadbolt, one shot must remove the deadbolt or catch. The normal shooting mode is for the shooter to place the barrel from 0 to 2 inches from the target. No lethal fragments should enter the room. The normal shooting mode for a 40mm breaching round would be to fire at the door from 20 to 300 feet. The round should completely remove the door, or at a minimum break off half of the door. If no vendor can meet the current requirements for the 40mm round, we will consider a round that can be fired from a side-loading grenade launcher. A side-loading grenade launcher has the advantage of accepting rounds of any length.

PHASE I: Design an affordable 12 gauge or 40mm round capable of breaching various door configurations. Conduct limited testing to demonstrate capabilities and limitations.

PHASE II: Fully develop and characterize how the ammunition functions in various weapon configurations (various barrel lengths, various chokes, etc.). Tests should include an independent determination of effectiveness and safety. Verify effectiveness and functional performance under a variety of test environments.

KEYWORDS: Ammunition, Shotgun, Weapons, Door Breaching, 40mm Grenade Launcher, M203.

SOCOM05-003 TITLE: Velocity Sensing Sonar for Naval Special Warfare Undersea Vehicles

TECHNOLOGY AREAS: Ground/Sea Vehicles, Sensors

OBJECTIVE: Develop and evaluate a prototype velocity sensing sonar that employs advanced sensor technology to measure 3D bottom and water referenced velocities for aiding navigation of small manned and unmanned underwater vehicles from high altitudes in the open ocean and near bottom in littoral waters. The sonar will be required to operate clandestinely.

DESCRIPTION: The challenge is to develop a deep-to-shallow velocity-measuring tracking system in a small package that will fit in the confines of existing Naval Special Warfare undersea vehicles. The

proposed system must provide high accuracy, high altitude bottom tracking velocity measurement, low altitude bottom tracking velocity measurements and water tracking velocity measurements. The velocity sensing sonar must have sufficient short-term precision and long-term accuracy over a wide range of altitudes to integrate with existing inertial navigation systems.

PHASE I: Develop an innovative design to accomplish a velocity sensing sonar. Identify expected performance enhancements to be achieved along with critical design parameters such as volume, power, cost, and technical risk. The technical challenge to guide innovative research is produce a higher accuracy, at greater altitudes, in a smaller package. These parameters (goals) include:

Total operational (altitude range): less than 1m to greater than 1000m
Total sensor volume: less than .5ft3
Total sensor weight: less than 20 lbs for 1000m, or less than 5 lbs for 500m altitude
Total sensor power requirement: less than 2 watts
Long term accuracy: .1% to .2% + 0.05 cm/sec
Short term accuracy (2 sec interval): less than .2cm/sec

PHASE II: Develop and demonstrate a prototype system in a realistic environment over extended and diverse operating conditions. Demonstrate improved navigational accuracy in deep and shallow water.

KEYWORDS: sonar, velocity sensing sonar, velocity sensing

SOCOM05-004 TITLE: Advanced Reconnaissance Sensing System, ARSS, for Naval Special Warfare Platforms and Equipment

TECHNOLOGY AREAS: Ground/Sea Vehicles, Sensors

OBJECTIVE: Design and demonstrate technologies supporting viewing and capture of real-time color intensified imagery, collection and processing of signal intelligence, and designating and marking of items of interest from Naval Special Warfare assets. Proposed sensors will be mounted on Naval Special Warfare maritime craft.

DESCRIPTION: Passive viewing and capture of high-resolution color still imagery and streaming video and the capability to mark, designate, or illuminate items or areas from naval Special Warfare assets are desired. A sensor that functions in low-light conditions and darkness using low-light level cameras, image intensified (I2) devices, infrared or thermal imaging in all wavelengths, and other approaches that provide a tactical advantage are of interest. Methods using hyper spectral imagery, image polarimetry, and other approaches that support fusing of data or extraction of marked, designated, or camouflaged items are also of interest. Proposed solutions will be constrained by such things as restricted volume, limited power, limited onboard processing, survival and function at depth in seawater, and neutral buoyancy aboard Naval Special Warfare vehicles. Human Systems Integration limitations such as limited dexterity, restrictive input devices, or reduced viewing visibility are also design constraints.

PHASE I: Design a system (sensor package and any associated interface/processing) that include specifications of predicted system performance, volume/cost/design/performance tradeoffs, critical design parameters for operational and tactical use, critical technologies to be pursued, anticipated performance enhancements, and technical risk. The technical parameters (goals) to guide innovative research included:

Total combined sensor volume: no greater than .2 ft3
Total combined sensor weight: no greater than 10 pounds
Total combined sensor power requirements: less than 150 watts
Sensor package max depth (fsw): greater than 200 ft
Imagery producing over the entire range of operationally encountered light levels from
Sunlight (104 ftcd/107,527 lux) to Overcast Night (10-5 ftcd/10-4 lux) conditions

PHASE II: Develop a prototype Advanced Reconnaissance Sensing System. Demonstrate its performance in a realistic environment and required interoperability with other equipment. Results will be compared against currently fielded capabilities.

KEYWORDS: Sensors, imaging, electronics, reconnaissance,